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Correlation between Percentage Distribution of Socioeconomic Status and Swimming Performance of Adolescent Indian Swimmers in Chennai, Tamilnadu India

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Abstract
Background: *Swimming have been an assessment to the physical ability of top athletes in portraying the performance limits of the human body. It is widely known that the right nutrition and exercise regimes are the main factors that contribute to the excellent physical performance of athletes. Athletic excellence depends on multi-factorials and socioeconomic status could be one of them. It is unknown if the socioeconomic status of a person can affect his/her own swimming performances, particularly among adolescent Indian swimmers. Therefore, the aim of this study was to determine whether the socioeconomic status of adolescent Indians affect their swimming performances.* ***Methodology:*** *Seventy controls (no swimming training) and 35 swimmers (at least 1 year of swimming training) aged 15-18 from Chenai, India participated in this study. Percentage distribution of the socioeconomic status was assessed using the Kuppuswamy's Socioeconomic Classification. The swimming performances was measured based on the average swimming time between control and swimmers in a100-meter freestyle sprinting swimming test. Data were analysed using t-test and multiple regression analysis.* ***Results:*** *Most of the controls and swimmers are from the upper-middle backgrounds. There was no significant difference in socioeconomic status between controls and swimmers. Although the average swimming time of the swimmers was significantly shorter than the controls, there was no correlation between their swimming performances and socioeconomic status.* ***Conclusion:*** *The socioeconomic status of adolescent Indians is not the significant factor that affects the swimming performances of control and swimmers.*

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I. Introduction

Sprinting swimming is a short and highly intensive locomotive sport of self-propulsion in water to reach the finish line at a given distance at the shortest time. It is observed that the fastest swimmers in world sports tournaments are usually claimed by the Westerns rather than Asians or even Indians, which may highlight the impact of socioeconomic differences on the swimming participations.

There is lack of studies on the impact of socioeconomic status specifically on swimming participations among Indians, but there are a few studies that looked at its impact on sports participation in general. Socioeconomic inequalities in sports participation seemed to be significantly associated with neighbourhood, household, and individual factors (Kamphuis et al. 2008). Iranian children born in families with higher level of social-economic status tend to participate more in sports (Nezhad et al. 2012). This may indicate that the socioeconomic status is a strong determinant of participation in sports training programmes that signify financial independence and support of well-adjusted families.It highlights that wealthy and well-adjusted swimmers are better athletes than poor swimmers. It is most probable that the high socioeconomic status signifies access to finer nutrition, education, environment, coaches, and facilities.However, it was found that socioeconomic status did not affect the extent of Iranian track-and-field athletes to participate in sports (Habibi et al. 2011). The discrepancy in the role of socioeconomic status on swimming proficiencies remains to be understood.

The proportionality of Olympic athletic swimmers is obviously skewed, which further necessitates the need to conduct studies to investigate factors that contribute to the large gap in swimming participations among Indians. By knowing that socioeconomic status of an athlete is important in swimming excellence, the lifestyle of such young athletes can be stressed upon and improved to create better athletes that can represent the country.

This study was done particularly on adolescent Indian swimmers to ascertain the role of their socioeconomic status on whether it influences their swimming performances.

II. Methodology

Inclusion and Exclusion Criteria of Subjects

The subjects for the swimmers' group were selected from various swimming schools located at Chenai, India, while the controls were selected from high schools nearby.The study was conducted at the Department of Physiology, Meenakshi Medical College and Research Institute, Enathur, Kanchipuram, and at Anna swimming pool, SDAT and Turtles swimming clubs in Chenai. The aim and importance of the study were explained to the subjects and their parentsat SethuBhaskara Matriculation School. All subjects were fully aware of the raised risks and stresses of this study. The swim coaches were also informed before the study was conducted. Volunteers were then selected based on the list of inclusion and exclusion criteria (Figure 1). Written and signed consent forms were obtained from the subjects and parents prior to the study. The informed consent was approved by the Human Ethical Committee of Meenakshi University. The study was conducted in accordance with the declaration of Helsinki of the World Medical Association. A total of 105 subjects were included in this study.

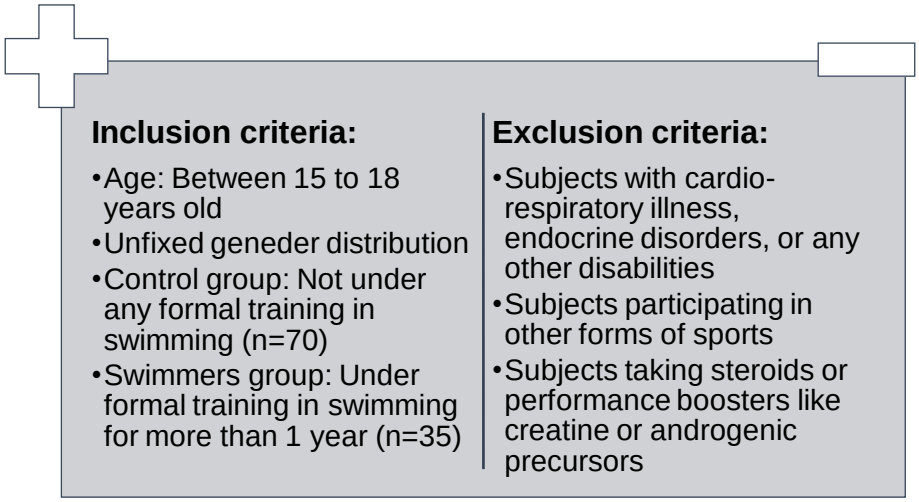

Figure 1: Inclusion and Exclusion Criteria of Control and Swimmers Group of Adolescent Indians

Socioeconomic Status Assessment

The socioeconomic status of each subject was assessed using a questionnairebased onKuppuswamy's Socioeconomic Classification. Table 1 (a-c) shows the modified Kuppuswamy's socioeconomic scale that includes the education and occupation of the head of the family (Table 1a) and the total monthly income for the whole family (Table 1b). The total score of each subject is then ranked into classes of upper, upper middle, lower middle, upper lower, and lower classes (Table 1c).

Table 1a: Kuppuswamy'sScale of Education and Occupation Status (Urban)

Education of Head of Family	Score	Occupation	Score
Professional degree	7	Professional	10
Graduate	6	Semi-profession	6
Intermediate/Diploma	5	Clerical/shop/farm	5
High School	4	Skilled worker	4
Middle School	3	Semi-skilled worker	3
Primary School	2	Unskilled worker	2
Illiterate	1	Unemployed	1

Table 1b: Kuppuswamy's Scale of Monthly Family Income

Total Monthly Family Incomein 1976 (Rs.)	Modified Total Monthly Family Income in 2008 (Rs.)	Score
≥ 2000	≥ 21,660	12
1000 – 1999	10,830 – 21,659	10
750 – 999	8122 – 10,829	6
500 – 749	5415 – 8121	4
300 – 499	3249 – 5414	3
101 – 299	1093 – 3248	2
≤ 100	≤ 1093	1

Table 1c: Total Score and Description of Socioeconomic Status

Total Score	Class	Class Description
26 – 29	I	Upper
16 – 25	II	Upper Middle
11 – 15	III	Lower Middle
5 – 10	IV	Upper Lower
< 5	V	Lower

100-meter Freestyle Sprinting Swimming Protocol

Forty out of 70 subjects from the control group who knows how to swim but had no professional swimming training were tested for the 100-meter freestyle sprinting. Forty-eight hours before the study was conducted, subjects were instructed to avoid vigorous exercise and consume their normal diet. The swimming performance was assessed in various swimming clubs. All participants subjected to swimming were first instructed to perform light exercises including jogging, stretching, moderate to high intensity striding and sprinting before their swimming performance were evaluated. The subjects stood leaning slightly forward and bodies bent at the edge of the pool. The starting helper stood at the starting line, while the timer stood at the finish line. The starting helper gave the command "Go" and swept his/her arm. The timer started the timing as the sweeping movement was seen and stopped the watch when the subject's chest passed the finish line. The subjects performed cool-down exercises by stretching the legs after the swimming test was conducted.

Statistical Analyses

Data were expressed as mean ± standard deviation. The difference in socioeconomic status and swimming performance between the two groups were analysed using t-test. The impact of socioeconomic status to swimming performance were analysed using multiple regression analysis. These analyses were performed using statistical tests contained in the Graph Pad Prism version 5. Statistical significance was set at $p<0.05$.

III. Results

Percentage Distribution of Socioeconomic Status

Most of the swimmers (68%) and non-swimmers (74%) are in the upper middle class (Table 2). Around 20% of both groups of subjects are categorized as upper class. There are no subjects that belonged to the lower class. There was no significant difference in the socioeconomic status between control and swimmers.

Table 2: Percentage Distribution of Socioeconomic Status of Controls and Swimmers

Group	Class (%)					p-value
	Upper	Upper Middle	Lower Middle	Upper Lower	Lower	
Control (n=70)	19	74	3	4	0	0.062
Swimmers (n=35)	17	68	9	6	0	

Swimming Performances

Table 3 and Figure 2 shows the swimming performances of controls and swimmers' group. The average swimming time of swimmers were significantly shorter compared to controls ($p<0.01$).

Table 3: Swimming Performances of Controls and Swimmers of Adolescent Indians

Group	Average Swimming Time (s)	p-value
Control (n=40)	103.25 ± 12.781	0.0062
Swimmers (n=35)	56.44 ± 1.299	

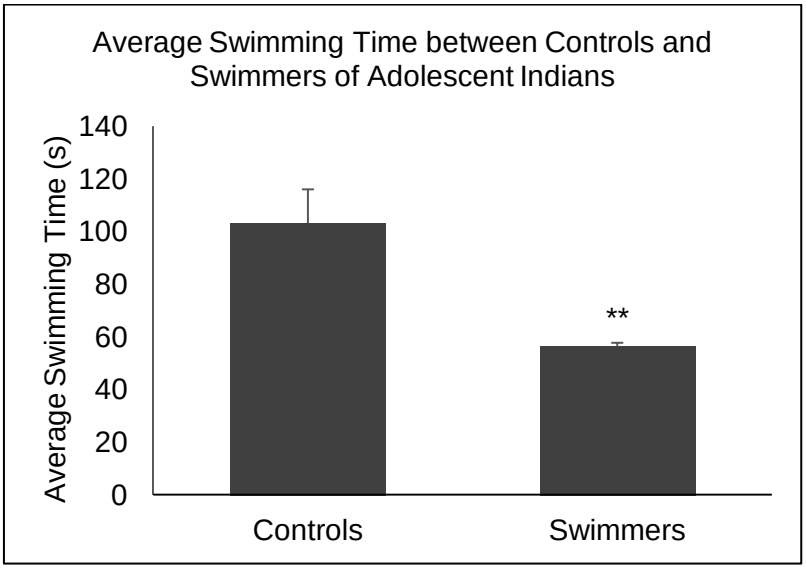

Figure 2: Swimming Performances of Controls and Swimmers of Adolescent Indians

IV. Discussion

This study has shown that the majority of controls and swimmers came from the upper-middle background, and there was no significant difference in the socioeconomic status between the two groups. However, the average swimming time of swimmers was significantly shorter compared to the controls, which shows that the swimming performances of trained swimmers are better than untrained subjects. Despite that, no correlation was found between socioeconomic status and swimming performances of adolescent Indian swimmers.

There are several studies that supported our findings. In Spain, the number of sports facilities and socioeconomic environment were not associated with swimming activities in both genders (Pascual et al. 2009).Socioeconomic status was not a factor that affects the sports participations of Iranian track-and-field athletes (Habibi et al. 2011).Recently, a swimming intervention programme conducted in Sweden did not improve on the swimming abilities of children in public primary schools with socioeconomic differences (Pilgaard et al. 2019). This study may indicate that swimming proficiencies was almost equivalent across the upper-middle class students specifically in Chenai, India. Nevertheless, the superior swimming performances of the swimmers may not be correlated with their socioeconomic status.

On the contrary, socioeconomic status was shown to be a valuable factor in swimming abilities as children in middle and upper classes are likelier to have access to swimming facilities (Ponessa, 1992). Children from Iran growing up in upper middle classes were found to participate relatively more in sports compared to children in low socioeconomic urban environment (Nezhad et al. 2012). In addition, socioeconomic status did influence the water competencies of young adult Polish males, most probably due to lack of facilities in smaller towns (Moran et al. 2017). It is possible that the absence of correlation between socioeconomic status and swimming performances among Indian adolescent swimmers found in this study may be due to the availability of government-funded swimming pools for public use. Furthermore, training programmes in swimming facilities across Chenai may be affordable even for students from middle and upper-middle classes.

Although no correlation was found between socioeconomic status and swimming performances of swimmers in this study, it does denote that the profound difference in swimming performances is due to other factors, which remains to be determined.Our previous study has found a significant difference in anthropometric measurements between controls and swimmers of adolescent Indians. (Jeyapal et al. 2017). The swimmers hadsignificantly larger height, mid-arm circumference, chest circumference, and waist circumference compared to controls (Jeyapal et al. 2017). Correlation analysis indicated that the improved swimming performances of the swimmers was strongly related to the difference in anthropometric measurements (Jeyapal et al. 2017).

In conclusion, socioeconomic status is not a fundamental factor that influences the swimming performances of adolescent Indian swimmers. Further study may look into other factors that may improve swimming performances such as the nutritional status or even genetic differences among swimmers.

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References

[1]. Habibi, Z., Beglou, N. A. B., Dana, A., Tarasi, Z. The relationship between socioeconomic status and extent of their participation in sports training in the Iranian track-and-field athletes. *International Journal of Sport*. 2011, Mar; *1*: 67-69

[2]. Jeyapal, C. P., Prakash, P. S., Sivalingam, S. P. An investigation on the anthropometric profile and its relationship with physical performance of adolescent indian swimmers – A comparative study. *IOSR Journal of Dental and Medical Sciences*. 2017, Mar; *16*(3): 118-126

[3]. Kamphius, B., Van Lethe, J., Giskes, K., Huisman, M., Brug, J., Mackenbach, P. Socioeconomic status, environmental, and individual factors, and sports participation. *Med Sci Sports Exerc*. 2008, Jan; *40*(1): 71-81

[4]. Moran, K., Podstawski, R., Mańkowski, S., Choszcz, D., Sarevic, Z., Socioeconomics influences on the water competencies of young adult polish males. *Physical Culture and Sport. Studies and Research.* 2017; *19*

[5]. Nezhad, M. A. H., Rahmati, M. M., Nezhad, M. M. Relationship between social-economic status of family and adolescent students on sport participation. *Annals of Biological Research.* 2012, Mar; *3*(8): 4012-4016

[6]. Pascual, C., Regidor, E., Martinez, D., Calle, M. E., Dominguez, V. Socioeconomic environment, availability of sports facilities, and jogging, swimming and gym use. *Health and Place*. 2009, June; *15*(2): 553-561

[7]. Pilgaard, F. I. H., Östergren, P. O., Olin, A., Kling, S., Albin, M., Björk, J. Socioeconomic differences in swimming ability among children in Malmö, southern Sweden: Initial results from a community-level intervention. *Scandinavian Journal of Public Health.* 2019, Jan

[8]. Ponessa, J. Student access to extracurricular activities. *Public Affairs Focus*, 1992; 23, 1–8.

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